

WHAT IS CLAIMED IS:

1. An apparatus for sterilizing or disinfecting fluids, comprising:
a fluid conduit;
a ultraviolet light source which is at least partially within the fluid conduit;
and
an air drive unit coupled to the fluid conduit, wherein said ultraviolet light source generates an ultraviolet light which kills microorganisms in said fluid.

2. The apparatus as recited in claim 1 wherein said ultraviolet light source comprises a protective sleeve, a casing for holding a gas and a vaporizable material, and at least one electrode electrically coupled to a power source for exciting said gas and said vaporizable material.

3. The apparatus as recited in claim 2, wherein said protective sleeve comprises a UV transmissive material.

4. The apparatus as recited in claim 3, wherein said protective sleeve is a fluoropolymer sleeve.

5. The apparatus as recited in claim 2, wherein said casing comprises a fluoropolymer casing.

6. The apparatus as recited in claim 2, wherein said casing comprises a quartz or glass casing and said protective sleeve surrounds said quartz or glass casing.

7. The apparatus as recited in claim 3, wherein said protective sleeve comprises a silicon polymer or silicone material.

8. The apparatus as recited in claim 4, wherein said fluoropolymer sleeve is made from a fluoropolymer selected from the group of fluoropolymers including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

9. The apparatus as recited in claim 6, wherein said protective sleeve protects said quartz or glass casing of said ultraviolet light bulb from breaking.

10. The apparatus as recited in claim 2, wherein said protective sleeve comprises a removable container.

1 11. The apparatus as recited in claim 2, wherein said protective sleeve
2 hermetically seals said ultraviolet light bulb.

1 12. The apparatus as recited in claim 1, wherein the fluid conduit is
2 partially submerged in liquid and partially exposed to gas.

1 13. The apparatus as recited in claim 3, wherein said protective sleeve
2 is heat shrunk around said quartz or glass casing of said ultraviolet light bulb.

1 14. The apparatus as recited in claim 3, wherein said protective sleeve
2 is form pressed around said quartz casing of said ultraviolet light bulb.

1 15. The apparatus as recited in claim 3, wherein said fluoropolymer
2 sleeve is formed around said quartz or glass casing of said ultraviolet light bulb by
3 dipping said ultraviolet light bulb into a liquid material.

1 16. The apparatus as recited in claim 2, further comprising a power
2 source, wherein said power source is a solar power source connected to said ultraviolet
3 light bulb, and wherein said protective sleeve surrounds said solar power source and said
4 ultraviolet light bulb and hermetically seals said solar power source with said ultraviolet
5 light bulb.

1 17. The apparatus as recited in claim 2, wherein said ultraviolet light
2 bulb comprises a first end portion, a second end portion, and an elongated body portion
3 formed between said first end portion and said second end portion, and wherein said
4 protective sleeve comprises a fluoropolymer sleeve covering said elongated body portion
5 and first and second end caps covering said first and said second end portions,
6 respectively.

1 18. The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

1 19. The apparatus as recited in claim 17, wherein said first and said
2 second end caps comprise silicone end caps.

1 20. The apparatus as recited in claim 17, wherein said first and said
2 second end caps are sealed to said protective sleeve using a silicone sealer.

1 21. The apparatus as recited in claim 1, wherein said fluid is either a
2 liquid or a gas fluid

22. A method of sterilizing or disinfecting a fluid, comprising the steps of:

pumping air into a fluid conduit to pump liquid through the fluid conduit;

placing an ultraviolet light source at least partially within said fluid conduit; and

illuminating said ultraviolet light source so that an ultraviolet light is generated, killing microorganisms in said fluid conduit.

1 23. The method as recited in claim 22, wherein said ultraviolet light
2 source comprises a casing for holding a gas and a vaporizable material, and at least one
3 electrode electrically coupled to said power source for exciting said gas and said
4 vaporizable material.

1 24. The method as recited in claim 23, wherein said protective sleeve is
2 a fluoropolymer sleeve.

1 25. The method as recited in claim 23, wherein said casing comprises a
2 fluoropolymer casing.

1 26. The method as recited in claim 24, wherein said casing comprises a
2 quartz or glass casing and said protective sleeve surrounds said quartz or glass casing. *AB*

1 27. The method as recited in claim 23, wherein said fluoropolymer
2 sleeve is made from a fluoropolymer selected from the group of fluoropolymers
3 including, PTFE, FEP, PFA, AF, and Tefzel ETFE.

1 28. The method as recited in claim 23, wherein said protective sleeve
2 comprises a silicon polymer or silicone material.

1 29. The method as recited in claim 26, wherein said protective sleeve
2 protects said quartz or glass casing of said ultraviolet light bulb from breaking.

1 30. The method as recited in claim 22 , wherein a protective sleeve
2 comprises a removable container.

1 31. The method as recited in claim 22, wherein a protective sleeve
2 hermetically seals said ultraviolet light bulb.

1 32. The method as recited in claim 22, wherein the fluid conduit is
2 partially submerged in liquid and partially exposed to gas.

1 33. The method as recited in claim 26, wherein a protective sleeve is
2 heat shrunk around said quartz or glass casing of said ultraviolet light bulb.

1 34. The method as recited in claim 26, wherein a protective sleeve is
2 form pressed around said quartz or glass casing of said ultraviolet light bulb.

1 35. The method as recited in claim 24, wherein said fluoropolymer
2 sleeve is formed around said quartz or glass casing of said ultraviolet light bulb by
3 dipping said ultraviolet light bulb into a fluoropolymer liquid material.

1 36. The method as recited in claim 22, wherein said power source is a
2 solar power source connected to an ultraviolet light bulb, and wherein a protective sleeve
3 surrounds said solar power source and said ultraviolet light bulb and hermetically seals
4 said solar power source with said ultraviolet light bulb.

1 37. The method as recited in claim 22, wherein a ultraviolet light bulb
2 comprises a first end portion, a second end portion, and an elongated body portion formed
3 between said first end portion and said second end portion, and wherein said protective
4 sleeve comprises a fluoropolymer sleeve covering said elongated body portion and first
5 and second end caps covering said first and said second end portions, respectively.

1 38. The method as recited in claim 37, wherein said first and said
2 second end caps comprise fluoropolymer end caps.

1 39. The method as recited in claim 37, wherein said first and said
2 second end caps comprise silicone end caps.

1 40. The method as recited in claim 37, wherein said first and said
2 second end caps are sealed to said protective sleeve using a silicone sealer.

